Space Weather Forecast

Issued on Saturday, 20 August 2022 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/G2 Minor Geomagnetic Storm possible mainly day 1 and day 3. R1 risk waning.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low with only Common class flares observed from the main sunspot in the southwest disc. This sunspot showed apparent decay, losing some visible spots and reducing in size, but perhaps this was in part due to the change in viewing angle as it approached the southwest limb. The other six sunspots populating the Earth-facing disc were less complex and smaller, with a mixture of bipolar and unipolar spots. No other Earth-directed CMEs (coronal mass ejections) were observed.

Solar Wind / Geomagnetic Activity: The solar wind speed was elevated to strong due to both the fast wind from a coronal hole and a CME arrival at 19/1702UTC. This rose to 700km/s before easing back to near 500km/s. The magnetic field strength increased from weak to moderate levels with the CME arrival. The north-south component was mostly variable and weak but with a period of moderately negative (southward pointed) field due to the CME arrival (19/1700-2000 UTC). Geomagnetic activity rose from Quiet to Active with a G1/Minor Storm (Kp5) between 19/1800-2100 UTC due to the CME arrival, then declined after 20/0300 UTC to be Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be moderate over the UTC weekend, with further moderate-class flares likely, primarily from the most active sunspot group. This region should rotate off the Sun into the new working week, with the chances of further such flares falling in tandem. No significant regions are expected over the eastern horizon in the period to slow this fall.

Solar Wind / Geomagnetic Activity: The geomagnetic forecast is low confidence throughout, largely the result of the sheer number of mostly minor CMEs, with some cases of glancing arrivals possible. These are most likely either later on day 1 (20th) or day 3 (21st). Otherwise CH14 fast wind is expected to gradually ease, but with a further enhancement possible day 4 (22nd). Geomagnetic activity is expected to be Quiet to Unsettled for much of the period, but with further spells of Active to G1 Minor Storms due to any CME glances, mainly late day 1 (20th) and later day 3 (22nd) into day 4 (23rd). These will also give a slight chance for G2/Moderate storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy

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protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	30	10	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	15	10	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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